

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY

FOREST INSECT INVESTIGATIONS

RECOMMENDATIONS FOR CONTROL OF MOUNTAIN PINE BEETLE  
INFESTATIONS WITHIN THE WHITE PINE STANDS  
OF THE KOOTENAI NATIONAL FOREST

January 16, 1923

Forest Insect Field Station  
Coeur d'Alene, Idaho

RECOMMENDATIONS FOR CONTROL OF MOUNTAIN PINE BEETLE  
INFESTATIONS WITHIN THE WHITE PINE STANDS  
OF THE KOOTENAI NATIONAL FOREST

-----

Index

	Page
INTRODUCTION	1
PETE CREEK, KOOTENAI NATIONAL FOREST	2
MEADOW CREEK, KOOTENAI NATIONAL FOREST	4
O'BRIEN CREEK, KOOTENAI NATIONAL FOREST	6
METHODS OF CONTROL	7
Location of Infested Trees	7
Control Procedure	9
CONCLUSIONS	9
MEMORANDUM	10

RECOMMENDATIONS FOR CONTROL OF MOUNTAIN PINE BEETLE  
INFESTATIONS WITHIN THE WHITE PINE STANDS OF THE  
KOOTENAI NATIONAL FOREST

-----

INTRODUCTION

This report deals with the recommendation for the institution of control measures against outbreaks of the mountain pine beetle within three drainages of the Kootenai National Forest. Though the substance of this matter has been presented to the District Forester in an informal memorandum, this report has been prepared for the purpose of presenting more clearly the status of the infestation, and to offer some few suggestions relative to the administration of the projects. In presenting this report with its recommendations, it is fully recognized that the Big Hole Basin project has priority rights on all allotments, and that if that project is continued in 1928 there is little chance that funds for additional control work within this District will be available. However, with the above realization, it is recommended that if the Big Hole Basin project is not continued in 1928, that sufficient funds be allotted for the institution of control measures within the following areas.

### Pete Creek - Kootenai National Forest

In 1925 there existed in the white pine stands of the Pete Creek drainage what appeared to be the start of a rather severe outbreak of the mountain pine beetle. The origin of this outbreak was somewhat of an issue, as a few miles to the north there existed a serious epidemic of the mountain pine beetle in lodgepole pine. Though there was no physical connection between these two outbreaks, there could be no assurance that the beetles had not flown from the lodgepole into the white pine and would continue to do so in the future. However, it was believed that the possibility of there being no relationship between these two areas and that the Pete Creek outbreak was local in character was of sufficient strength to justify the institution of control work.

The white pine within this region suffered a severe foliage injury at the time of the sudden drop of temperature which occurred in December 1924. At the time this area was examined in the fall of 1925, the foliage of practically every white pine tree showed the effects of this freeze. That this injury to the trees, which was practically a defoliation, might make them more susceptible to insect attack was an added reason for the recommendation of control.

For the purpose of instituting control measures during the season of 1926, an allotment of \$2,000 was secured. After the work was under way, it was found that there were more infested trees than had been estimated, and additional funds were requested.

During the operation 693 trees were treated at a total cost of \$2,584, or \$3.73 per tree.

This area was examined again in the fall of 1926 and though the work had been thoroughly performed, a rather startling number of 1926 attacked trees was found. Control measures were again recommended for the 1927 season, for it was still possible that the 1926 attacks had come from trees left during the operation. During the season of 1927, 664 infested trees were treated at a cost of \$1,689, or \$2.54 per tree. This shows a reduction of \$1.19 per tree. The area was examined again in September 1927 and, though the examination was a very extensive one, it was found that on  $5\frac{1}{2}$  miles of strip, or 62.2 sample acres, there was one 1927 attacked tree to every five acres. From this data it is estimated that there will be from 250 to 300 trees which will require treatment in 1928.

The effects of the December 1924 freeze can still be noticed within this area. Many trees which have died from the effects of it harbor secondary attacks of the mountain pine beetle. , During the recent examination of this area several of these trees, which gave an appearance of having been dead for several years as no foliage remained, were recorded as having been newly attacked by insects. The cambium of these trees, though not in a healthy condition, was still green. Not all of these dying trees have been attacked by insects, and they can be

spotted by the moist or saturated appearance of the bark on the lower 10 or 12 feet of the bole. This saturation no doubt results from the loss of foliage with an unimpaired root system.

During the past two seasons the work on this area has been very thoroughly executed and though undoubtedly a small per cent of the infestation was missed during the control work, it seems hardly feasible to explain the existing reinfestation as coming from these few trees. It is believed that the annual reinfestation, which is following the control measures, can be explained in no other way than by the fact that the beetles are flying into this area from the lodgepole pine infestation which lies but a few miles to the north. However, even with this realization it is recommended that the project be continued for at least one more season. This position is based upon the following points: (1) experimental values of the project; (2) possibility of this area acting as a stepping stone for the spread of the infestation into adjacent regions; (3) there being an increasing infestation in the area the project is justified as an attempt to save the remaining timber.

#### Meadow Creek - Kootenai National Forest

On September 21 an extensive examination was made of the South Fork of Meadow Creek. Several years ago a severe epidemic of the mountain pine beetle occurred in this drainage, and practically the entire white pine stand in the lower portion of the

drainage was killed at that time. In this portion of the area the site has been taken by the subspecies, there being practically no white pine remaining. Above this devastated area which extends for a mile or so up the stream, there exists a splendid body of mature white pine. This body of timber, which covers some 4,000 acres, extends north into the North Fork of Meadow Creek. A sample strip was run through this area which totaled 32.7 acres. On this strip sixteen 1927 and five 1926 (red-tops) attacks were found. From this examination, which though very extensive is believed to be sufficient to give a fair sample of the region, it is evident that a condition is developing within this drainage which is above a normal infestation. It is estimated that there are from 1,500 to 2,000 - 1927 attacked trees within the Meadow Creek drainage. In view of this fact it is recommended that control measures be instituted within this area in the spring of 1928. Inasmuch as the present status of the infestation within this drainage seems to indicate that an outbreak of the mountain pine beetle is pending, the above recommendation is justified on an entomological basis. Furthermore, this region is somewhat isolated from other bodies of white pine, and the results obtained would have certain experimental phases which would be of value in the planning of future control projects.

### O'Brien Creek - Kootenai National Forest

On September 23 an extensive examination was made of the O'Brien Creek drainage. A sample strip covering approximately 30 acres was run through this area and it is believed a representative sample was secured. From this sample it was found that the 1927 attack averaged approximately one-half (.43) of a tree per acre. It is estimated that there are from 1,000 to 1,500 infested trees which would require treatment in the event of a control operation being inaugurated. The data secured, which is similar to that from the Meadow Creek drainage, indicates that a condition is present within the drainage which is above a normal infestation. It is recommended that the infested trees within this drainage be treated during the spring of 1928. This recommendation is justified entomologically from the standpoint of timber protection, as well as the experimental phases of the project which would be secured.

### ALLOTMENTS

It is recommended that the sum of \$9,322 be allotted for forest insect control work on the Kootenai National Forest. A tentative allocation of these funds is as follows:

<u>Area</u>	<u>Infested Trees</u>	<u>Allotment</u>
Pete Creek	300	\$ 932
Meadow Creek	1500-2000	5595
O'Brien Creek	1000-1500	2795

The justification of these expenditures on an economic basis would seem to be a problem for the determination of the Forest Service. Though these projects would all contain experimental value which would be of a benefit to us in future control work, it is felt that they should be regarded on a more or less economic basis. The question of determining if the present and expected stumpage value of the mature white pine within these areas will justify this expenditure with the necessary maintenance work to follow would seem to be a strictly Forest Service problem.

#### METHODS OF CONTROL

##### Location of Infested Trees

It is recommended that 3-man spotting crews be employed -- these crews to be made up of a compassman and two spotters. The duties of the compassman, who in most cases will be the chief of party, will be to pace the distances covered, run his lines on a compass bearing and to construct a map of the area showing the location of the infested trees, and to keep the spotter's daily record of the trees marked. He, if chief of party, will also be responsible for the proper selection of trees to be marked. Each spotter should cover a strip one chain in width on each side of the compassman and will be held responsible for the location of all infested trees within this strip. In heavy white pine types it is necessary to examine practically every tree in order to

find all of the infested ones. Infested trees should be marked with a white tag, 4x6" in size, made from sign painter's cloth, which bears the tree number, d.b.h. and height treated. These white tags will enable the control crews to relocate the trees marked for treatment a great deal easier. In addition to these tags, the trees should be blazed on the opposite side and a letter "T" marked thereon with a lumberman's crayon. This extra marking seems necessary due to the fact that a small per cent of these cloth tags are destroyed by squirrels, deer, etc. The tags from the treated trees are brought in at the end of each day's work by the control crew foremen and the tree numbers checked, from the spotters' daily record, by the camp manager. This will insure the treatment of all marked trees.


The map is a very essential part of the spotters' work. Neat, accurate maps greatly expedite the labor of the control crew in the saving of time wasted in the searching for new trees to be treated. In the construction of a map, it is necessary for the compassman to pace all distances. Pacing, of course, slows down the speed of the spotting crew but is compensated for in the greater efficiency of the spotters, as in this manner they have time to examine every tree upon their strip and still keep abreast of the compassman. It is believed that the crew foremen will find the maps a far more efficient method of relocating the marked trees than by following out the spotters' strips.

### Control Procedure

The infested trees which are marked by the spotters are felled and the bark peeled to the height of the infestation. This work should be performed as early in the season as possible, while the broods are in a larval stage. The bark should be peeled from the wood and not chopped, for if a layer of wood is taken with the piece of bark the insects beneath will mature and emerge.

### CONCLUSIONS

This office will be glad to discuss in detail any of the points of this report which are not clear. Should it be possible to institute these projects the writer will assist in every possible way to make them a success. Reference is made to the memorandum submitted from this office under date of March 11, 1927, to the forest officer in charge of the Pete Creek project, relative to administrative suggestions for the 1927 season.



James C. Evenden  
Associate Entomologist

January 16, 1928.

Libby, Montana,  
October 24, 1927

MEMORANDUM FOR FILES

We set up camp on Pete Creek on May 10, 1927, with a crew of three men. Finished camp on May 12 at which time the foreman came up with eight men, this making a crew of 12 men and myself.

The same methods were followed as in 1926 with the exception of width of strip for spotting crew which was  $1\frac{1}{4}$  chains in 1927 as against  $2\frac{1}{2}$  chains in 1926. The  $1\frac{1}{4}$  chains appears to be too wide in a heavy stand of white pine as there were 125 trees found in the area by the treating crew and foreman that were missed by the spotters. The spotters were experienced as they were both in the spotting crew in 1926 and did very good work.

The area covered in 1927 was about 80 acres larger than in 1926. This area was on the east side of Pete Creek.

The 1927 attacks were found to be in from 1 to 7 trees in each group where last year there were as many as 50 trees in a group.

In the 664 trees treated, there were 528 white pine and 136 lodgepole.

Mr. Klehm called my attention to what I think would be a very good method of spotting bug-attacked trees while we were estimating timber on Keeler Creek this fall. There are a few new attacks on this area and in going through in scouting where the snow was on the ground, the dead needles could be seen on the snow where it was almost impossible to see the pitch tubes in the tree in a heavy stand of timber where there is not much light.

In my experience the last two seasons on insect control work, I find that the spotting is one of the most important jobs and in white pine stands of timber where our work will be in the Kootenai Forest I find that it is impossible for the spotters to get more than 30% of the trees in the spring of the year when there is no snow on the ground.

We will have three areas next year: Pete Creek, Meadow Creek and O'Brien Creek. I believe there would be a saving of time and money to build a cabin on each of these jobs this fall and do the spotting some time this coming winter on the snow. The cabin could be used for a camp for the next two or three years or as long as control work was necessary, and also a smaller crew would handle the work in the spring as no spotters would be needed.

With the cabin it would cut the cost of packing since the Government pack stock is not available in the spring when control work starts. All the equipment and some of the supplies could be packed in in the fall before the pack stock was taken to winter pasture.

The cost of building the cabins would be about \$150.00 each. This would be a cabin about 18x24 feet. Would probably need a larger cabin on Meadow Creek or two smaller ones could be built.

# SUMMARY OF LABOR COST

Travel	\$131.59
Packing, horses & packer	101.50
Trucking and railway freight	31.23
Setting up & moving out camp	57.22
Cook house, cutting wood & cook's wages	141.37
Spotting	235.20
Treating	686.70
Foreman	141.75
Equipment	13.25
Overhead, Forest officer	150.00

3 23 3

1689.21

Man-days spotting -- 56 @ \$4.20 per day \$235.20  
Trees spotted -- 539 pick up trees 125, Total 664  
Cost per tree, spotting, figuring 539 trees -- .4363  
Man-days treating -- 163.5 @ 4.20 per day \$686.70  
Trees treated ----- 664  
Cost per tree, treating crew only ----- 1.0343  
Total labor cost per tree, including Foreman &  
Overhead, Travel, Cookhouse, setting up and  
moving camp, treating and spotting ----- 2.325  
  
Total of all cost per tree ----- 2.545  
Forty cents per meal was included in the wages of  
above summary, covering all subsistence expenditures.

Ed Henrichs

Forest Ranger.